

Tunable Antenna Matching Circuit

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Related Applications

This application claims the benefit of U.S.

5 Provisional Application 60/283,093, filed April 11, 2001, which is hereby incorporated by reference. In addition, this application relates to U.S. applications now U.S. Pat. No. 6,690,251, now U.S. Pat. No. 6,639,491, 09/904,631 filed on July 13, 2001, 09/912,753 filed on July 24, 2001, 09/927,732 filed on August 8, 2001, now U.S. Pat. No. 6,690,176, 10 09/927,136 filed on August 10, 2001, "Tunable Capacitor," filed on January 11, 2002, and "Antenna Interface Unit," filed on February 8, 2002, which are hereby incorporated by reference.

15 **BACKGROUND**

Wireless communication devices, such as, but not limited to, wireless telephones, use many electronic components to transmit and receive signals over the air. A transceiver is the part of a wireless telephone that actually sends and receives signals. The front end of a transceiver is the portion of a transceiver closest to the air interface in the signal path. The

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An important function of the duplexer is to isolate the transmit signal from the receive path of the transceiver. The transmit signal is typically much stronger than the receive signal. Some of the transmit 5 signal inherently gets down the receive path. But this transmit signal going down the receive path must be greatly reduced (or attenuated). Otherwise, the transmit signal going down the receive path will swamp, or overwhelm, the receive signal. Then the wireless 10 telephone will not be able to identify and decode the receive signal for the user.

The required attenuation of the transmit signal going down the receive path is achieved at some expense. The duplexer also attenuates the transmit 15 signal going to the antenna for transmission. This attenuation in the transmit signal going to the antenna is known as loss. It would be beneficial to reduce the transmit path loss in the duplexer.

John Additionally, the duplexer typically must be large 20 to accomplish the receive path attenuation of the transmit signal. Consumers are continually demanding smaller and smaller wireless telephones with more and more features and better performance. Thus, it would be beneficial to